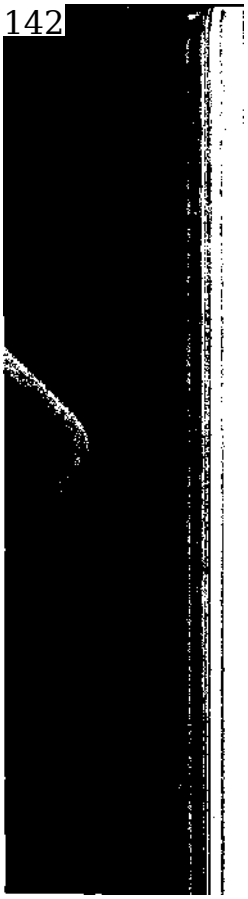
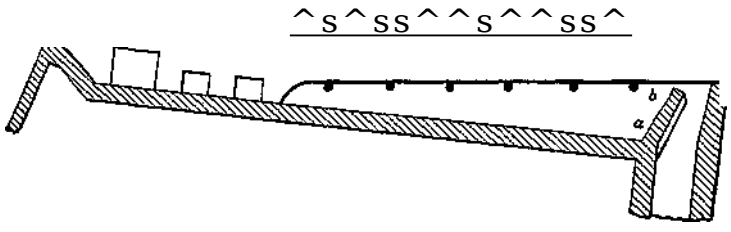


other. This drop in the roof acts as a dam to arrest the -flow of the gases for a sufficient length of time for the completion of combustion. Fig. 120 shows the Morgan type of roof. The drop in the roof simply checks the flow of the hot reacting gases; the port through which the gases enter the heating chamber is located some distance above the hearth. The author believes that these



D n n n o n

FIG. 121.

two methods of retarding the flow of the combining gases and promoting combustion are equally good.

However, it is here necessary to call attention to an error often

made in the design of these furnaces. The working doors, *A, B,* and *C* must not be located at different heights. If these doors are placed at different heights, *the highest door acts as a chimney* in conjunction with the lowest door. Cold air will be drawn into the heating chamber at the lowest opening while a jet of flame

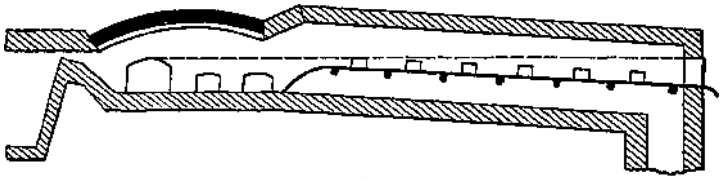


FIG. 122.

and smoke will escape from the highest opening. The sills for all of the working openings should be placed at the same level.

The last three illustrations in this chapter show the reconstruction, according to the direction of the author, of two very costly furnaces of a Swedish type. These furnaces were installed in a plant located in the Oural district.

Fig. 121 shows the longitudinal section of the furnace as originally built. During its operation it became very apparent